DRAFT
Environmental Assessment

for the

Two Dynamic Tests for Protective Elements and Vehicles Project

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1.0 WHAT IS THE PROPOSED ACTION?

The U.S. Department of Energy (DOE) proposes to conduct two security technology systems tests. These tests are part of DOE's ongoing requirements to ensure that the security vehicles, barriers, and other measures used at DOE sites nationwide provide protection for its facilities.

DOE protects its facilities using items such as fences, cameras, barriers and vehicles, including manned security cars. The proposed project would perform two tests on these protective elements and vehicles, as if they were subjected to a vehicle explosion. Instead of using an actual vehicle, a platform would be used to simulate an explosive-laden vehicle. Neither test would use more than 15,000 pounds (lbs) TNT-equivalent of explosives.

This proposed project would consist of two explosive events conducted over a period of 18 months. Two tests are needed due to the amount of protective elements and vehicles being tested. The first test would take place in autumn of 2005 and would consist solely of testing existing protective elements and vehicles. The second would take place in 2006 and would test additional protective elements and vehicles as well as newer protective devices.

The objective of this environmental assessment (EA) is to evaluate the potential environmental impacts from the two proposed tests.

This document was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190), as amended, Council on Environmental Quality NEPA Regulations [40 Code of Federal Regulation (CFR) Parts 1500-1508], DOE Order 451.1, and DOE NEPA Implementing Procedures (10 CFR Part 1021). This EA would serve as the basis for issuance of a Finding of No Significant Impact or lead to a determination that an Environmental Impact Statement is required for the proposed action.

2.0 WHY DO WE NEED THIS PROPOSED PROJECT?

In today's world, effective security systems are needed to protect people and facilities and those systems must be reassessed as potential threats change. High-profile vehicle bombings against U.S. targets include: the 1993 World Trade Center; the 1995 Federal Building in Oklahoma City; and the 1996 U.S. Air Force Khobar Tower military apartments in Saudi Arabia.

Terrorist attacks against United States targets have caused many government agencies to upgrade threat evaluations, infrastructure, and physical security systems to protect critical targets. Adversaries often use vehicle bombs to destroy targets and kill innocent citizens. The frequency, size, and severity of these attacks against American targets compel DOE to continually test and fortify our security barriers to mitigate any vulnerability to vehicle bombings.

DOE has special protection needs at locations throughout the United States that are important to national security. To ensure that secure protection methods are in place, DOE must continually assess the storage and security systems that for its facilities. As potential threats increase, additional assessments are needed to ensure continued security is maintained.

The Idaho National Laboratory (INL) has a history of using explosives in testing for similar types of projects. The two areas that can currently handle testing using explosives at the INL are the Weapons Range and the Mass Detonation Area. For over eight years, the Weapons Range has simulated a variety of scenarios and can utilize up to 2000 lbs TNT-equivalent of explosives. The Mass Detonation Area has been utilized for small-scale vehicle explosion testing and can utilize up to 500 lbs TNT-equivalent of explosives. These two areas cannot be used to detonate a test with an explosive weight of up to 15,000 lbs TNT-equivalent of explosives because of their proximity to INL facilities.

The information gained from these tests would enable DOE to better evaluate the impacts on protective elements and vehicles used to secure its buildings. Other federal, state, and local agencies could benefit from the data from these tests to improve security measures. This information may also be used in future computer modeling tools used for security measurement calculations.

3.0 WHAT ALTERNATIVES WERE CONSIDERED?

The following three alternatives were considered for this proposed project:

1. Perform the tests near Road T-23 at the Idaho National Laboratory (INL). **This is the preferred alternative.**
2. No action – Do not conduct the two tests.
3. Perform the tests at a non-INL site.

3.1 What is the Preferred Alternative and Where Would it be Located?

The preferred alternative is to perform the two tests at the Idaho National Laboratory (INL) site near Road T-23. The first test would take place in the autumn of 2005 and the second test during the summer or autumn of 2006.

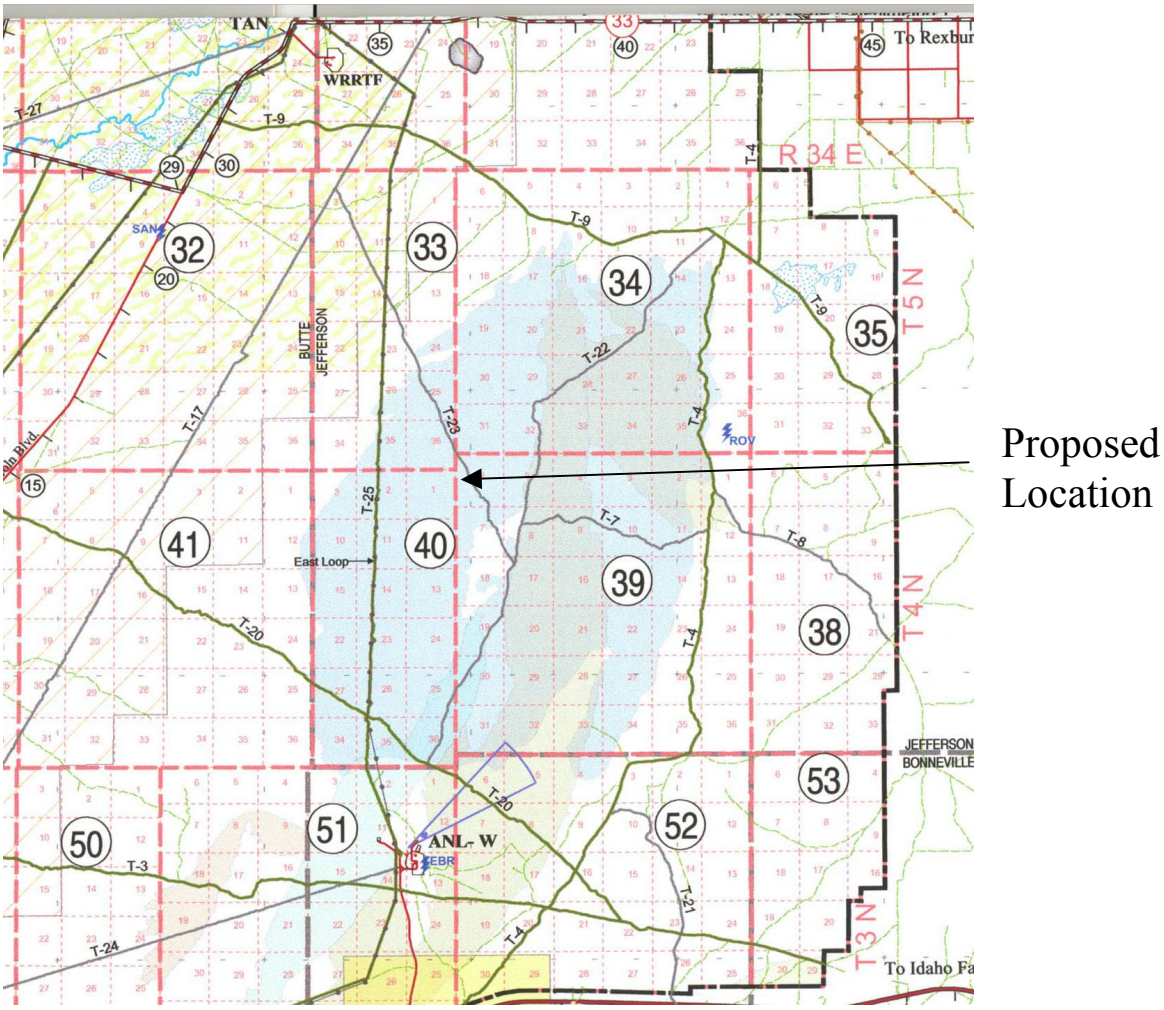
3.1.1 Where is the Proposed Test Area?

The proposed site location is approximately 550 feet west of road T-23. This is approximately halfway between the Materials and Fuels Complex (MFC, formerly Argonne National Laboratory-West) and Test Area North (TAN). The proposed site is located 8.4 miles from the nearest INL site boundary, 8.6 miles from the nearest public road, and 11.1 miles from the closest inhabited building.

The proposed site is in an area that does not contain unexploded ordnance. It is, however, down range from the throw area of the large gun barrel tests that were performed from 1942 through 1945, when the INL site was used as the Naval Gunnery Range. Although the proposed test area is approximately 18 miles from where the large gun barrel tests took place, projectiles

were expelled in an area just east of the proposed test location. There is a possibility that one of these projectiles could be found on the upper end of the proposed test site. However, since inert rounds were used to test the gun barrels, these projectiles present no hazard. The specific location is shown in Figure 1 below.

Figure 1 Location of Proposed Test Site



The proposed test area is in the shape of a circle. A platform simulating a vehicle containing a charge weight of not more than 15,000 lbs TNT-equivalent ammonium nitrate and fuel oil (ANFO) would be placed in the center of the circle. No more than 250 lbs of booster material (RDX) would be used to ensure that the ANFO properly detonates. These 250 lbs would not be in addition to the 15,000 lbs, but would replace up to 250 lbs of the ANFO.

Various protective elements and security-type vehicles would be placed in the area surrounding the vehicle at different distances from the center. Operations personnel would detonate the ANFO from a safe distance. Recording devices would be placed at a variety of locations around the test site to record data from the explosion.

3.1.2 What does the Proposed Area Look Like under the Preferred Alternative?

The proposed location is undisturbed. It has not been subjected to INL construction or project activities; however, it is an area that was burned by a wildfire in 1999. The area has recovered mainly with native grasses. After a fire event, the main vegetation that is the first to recover includes grasses such as Indian ricegrass, needle-and-thread grass, and western wheatgrass, forbs such as tapertip hawksbeard, and globemallow, and shrubs like green rabbitbrush all of which are present in the proposed project area. No sagebrush is present. Figure 2 depicts the general winter landscape of the proposed location:

The proposed test site is part of the Twin Buttes Grazing Allotment. The Bureau of Land Management (BLM) issues livestock grazing permits for the season of April 1 to June 30 and November 15 to February 15. As a result of the 1999 wildfire, there is an abundance of available grass in the area with little or no brush to interfere with grazing. Sheepherders controlling the herds would be inclined to move animals into this area, during their authorized period of use, as a result of the easily available forage. However, since livestock grazing animals are moved by their owners to higher elevation grazing allotments during the summer and early Fall months, there should be no livestock present during the time of the first test and possibly not during the second test, depending when the activity is scheduled. Any livestock that would be present during the period from July 1 to November 14 would be either unauthorized by the U.S. government or part of an exception allowance issued as part of a BLM trailing permit. A security perimeter would be established during the test period to control access into the proposed area.

Figure 2 Winter landscape of the proposed test area.

3.1.3 What Construction or Preparation is Necessary for the Preferred Alternative?

The site preparation would consist of mowing a location approximately 450 feet in radius at the selected location to reduce the probability of accidental range fires. The area in the center of the range, approximately 120 feet in radius, would be cleared of all vegetation and leveled.

This proposed project would not require installation of water well, septic, or other waste systems. Proposed project personnel would use bottled water and portable sanitary facilities on site. Proposed project activities may use small portable electrical generators, but would not construct new power lines.

Access into the area would be from Idaho Highway 33 West of Mud Lake onto an unnamed 2-track dirt road that is 0.5 miles east of Circular Butte, and south to T-23. These roads appear to be adequate but may require periodic water application due to the sandy soil consistency. In addition, these roads would be used in the current two-track manner to protect the vegetation in the middles and sides of the road. Only these identified roads would be used for the proposed project and speeds would be held below 15 miles per hour at all times.

No construction is anticipated other than the test platform and test elements, neither of which would be constructed at the proposed test location.

The explosives that would be used for this test are ammonium nitrate and fuel oil (ANFO). The ANFO would be transported to the INL specifically for the test, unloaded at the test site, and used for the test. The truck carrying the ANFO would be a box-type truck and would arrive the day before the test at the test bed. It would be parked for a very short period of time within the 450-foot radius while the ANFO is unloaded. The truck would then leave the INL. The ANFO would be guarded in accordance with existing INL procedures.

The test articles used in this investigation would consist of concrete and composite barriers, walls of various materials, fences, electronic sensors, closed circuit television cameras, and other items commonly associated with protective design systems. Proposed project personnel would have the test articles built elsewhere and transported to the site for testing.

The total time required for preparation, execution, and cleanup for each test would be approximately 240 hours. Pickup trucks and light-duty vehicles would deliver the test elements to the location. Nothing larger than a 2.5-ton truck would be used to transport the test items. All staging and laydown areas would be contained within the 450-foot radius mowed area.

3.2 WHAT IS THE "NO ACTION" ALTERNATIVE?

NEPA regulations require that the "no action" alternative be considered for every proposed project requiring an EA or EIS. In this case, taking "no action" means that the tests would not be conducted. If this occurs, DOE would not obtain the test data.

3.3 WERE NON-INL SITES CONSIDERED?

Within DOE, there are currently two other sites besides INL that conduct testing using explosives. These are Sandia National Laboratory (SNL) and Nevada Test Site (NTS). SNL was originally considered, but was rejected due to limits on their testing capability. Because the city of Albuquerque has grown so close to SNL, the current limit for explosives tests is just 485 lbs of TNT-equivalent explosives.

In the past, NTS has done some large tests using explosives. However, because NTS has radiological contamination on a large portion of the site, it would be difficult to avoid radiological contaminants being introduced into the air with an explosion of this magnitude. Finally, it would be time-prohibitive to perform the tests at NTS and it is time-critical to perform this assessment.

Outside of DOE there are currently three locations in the United States that have the capability to handle explosive events of this size. These include: Eglin Air Force Base, Florida; White Sands Missile Range, New Mexico; and the Energetic Materials Research and Testing Center (EMRTC), in Socorro, New Mexico.

Both Eglin Air Force Base and White Sands Missile Range are Department of Defense (DOD) facilities. As such, their primary focus is the support of DOD's interests. These ranges are in continual use for efforts to support the Iraq and Afghanistan wars, making it very difficult and expensive for DOE to conduct research in a timely and cost effective manner. Currently, there are waiting periods of up to three years for these DOD ranges.

EMRTC is near Sandia National Laboratory and allows DOE to perform explosives testing. Tests using up to 20,000 pounds of TNT-equivalent explosives can take place there. All of the work is performed by EMRTC, which is a division at the New Mexico Institute for Mining and Technology. However, there are some elements of these two tests that DOE is proposing to conduct that are potentially "classified". The EMRTC employees work for the New Mexico Institute for Mining and Technology and do not possess the appropriate level of DOE security clearance, or need to know, to support these tests.

4.0 WHAT IS THE AFFECTED ENVIRONMENT?

The term "affected environment" refers to the physical features, land, area, or areas to be influenced, or impacted, by an alternative under consideration. The proposed location of the two tests is in the area known as the Twin Buttes Allotment. The following information gives specific details on the affected environment for the proposed alternative. Much of this information was incorporated from the Bureau of Land Management's Environmental Assessment titled "Grazing Permit Renewal for Twin Buttes Allotment" (EA ID-074-2004-026), dated May 2004 and the "Ecological Review for an Environmental Assessment for the Two Dynamic Tests for Protective Elements and Vehicles Project" prepared by Stoller Corporation in August 2005.

4.1 Cultural Resources

Cultural resources found within the undisturbed rangelands of the INL near the proposed test area include historic and prehistoric archaeological sites, historic trails and wagon roads, and traditional cultural properties important to local tribal people from the Shoshone-Bannock Tribes. Cultural resources are managed at the INL according to a tailored Cultural Resources Management Plan and corresponding Programmatic Agreement executed among DOE's Idaho Operations Office (DOE-ID), the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation. Tribal interests in INL resources and activities are addressed in successive Agreements-In-Principle between DOE-ID and the Shoshone-Bannock Tribes. All activities and management approaches outlined in these documents are based on federal law, regulations, and DOE orders and policies that ensure the resources are considered in project planning and execution.

Archaeological sites near the proposed test area reflect human use of the northeastern Snake River Plain for 12,000 years or more. Campsites, tool modification localities, food processing stations, and rock circles and alignments all reflect native aboriginal use of the high desert while trash scatters, stone foundations, canals associated with early attempts to homestead and irrigate the area, trails, and homestead claims reflect more recent activities. An intensive archaeological survey was conducted at the proposed test site. The survey covered an area from the test location and out approximately 450 feet in radius. No sensitive archaeological resources were observed in the proposed location.

The Shoshone-Bannock Tribes considers the INL site part of their aboriginal homeland. From this perspective, the site contains many localities that are of traditional, cultural, educational, and religious importance. This includes not only archaeological sites, which are considered to be part of Shoshone-Bannock ancestral heritage, but also air, water, plants, animals, and features of the natural landscape. The Shoshone-Bannock Tribes have visited the proposed test area on several occasions, identifying ceremonial plants within the 450 ft blast radius. Concerns have also been expressed about potential impacts to other plants, animals, lava tube caves, and groundwater. Potential impacts to archaeological sites as a result of road upgrades were a concern. However, no road upgrades are planned as part of this proposed action.

4.2 Air Quality

The INL and the surrounding area are formally designated as an attainment area for the criteria pollutants (such as SOx, PM-10) for which a national ambient air quality standard exists. It is further classified under the Clean Air Act as a Prevention of Significant Deterioration Class II area, an area with reasonable or moderately good air quality that allows moderate industrial growth. Craters of the Moon Wilderness Area, which is approximately 6.4 miles southeast from the INL boundary, is classified as a Prevention of Significant Deterioration Class I area, and is the nearest area to the INL where addition degradation of local air quality is severely restricted.

The INL routinely monitors air quality using a network of air monitors. These monitors collect samples for measurement of particulate matter, radioactivity, and other air pollutants.

4.3 Soils

The soils in the area of the proposed test site are generally described as sands over basalt and are part of an area often referred to as the Grassy Butte-Rock Outcrop Complex. This complex of soils includes a number of soil mapping units. Grassy Butte (very stony loamy sand) makes up about 30% of this complex and the Rock Outcrop makes up about 20%. These two specific soil-mapping units are not present within the 450-ft radius area around the test site. The remaining 50% of this soil complex is made up of about equal parts of Grassy Butte 10 – 40 inches deep to bedrock, Grassy Butte 40 – 60 inches deep to bedrock, Matheson loamy sand, Bondfarm sandy loam, and Grassy Butte loamy sand. The Bondfarm sandy loam is a shallow soil and not likely present at the proposed test site. The soil at the test site is most likely the Grassy Butte series.

Characteristics common between the Grassy Butte soils and the Matheson loamy sand include: 1) very deep, well drained to somewhat excessively drained sands, 2) sands are wind deposited, 3) the soils are calcareous throughout their depth and have a lime accumulation beginning at 10 to 19 inches deep, and 4) the hazard of soil blowing (wind erosion) is very high. Due to the flat terrain water erosion is not a problem in the proposed test location.

Because of the high hazard of soil blowing, these soils are not suited to typical rangeland management treatments including seeding. They have a soil classification of "Capability Class VIIe) which means they are unsuitable for cultivation due to erosion. Also, these soils have impaired trafficability (the capability of the terrain to bear traffic).

4.4 Vegetation

The proposed project area is currently undisturbed. The area was burned in 1999 and native vegetation is recovering well. After a fire event, the main vegetation that is the first to recover includes grasses such as Indian ricegrass, needle-and-thread grass, and western wheatgrass; forbs such as tapertip, hawksbeard, and globemallow; and shrubs like green rabbitbrush, all of which are present in the proposed project area.

4.4.1 Special Status Plant Species

According to BLM, there are no known occurrences of threatened or endangered plant species within the Twin Buttes Allotment. Table 1 lists special status plant species that have been identified by BLM as occurring or potentially occurring within the Twin Buttes Allotment.

Table 1 Special Status Plant Species and occurrence within the Twin Buttes Allotment

Species	Status[a]	Occurrence	Remarks
Iodine bush	S	Potential	Potentially suitable habitat
Picabo milkvetch	S	Potential	Potentially suitable habitat
Earth lichen	S	Present	Known to occur
Spreading ipomopsis	S	Potential	Potentially suitable habitat
Obscure scorpion plant	S	Potential	Potentially suitable habitat
Red glasswort	S	Potential	Potentially suitable habitat

a. S = BLM Sensitive Species

An ecological assessment of potential sensitive plants was conducted for the proposed test location in July 2005. A list of sensitive plant species that potentially occur within the area affected by the test blast was compiled using data from the Idaho CDC (2005). All sensitive species known to occur in Butte, Custer, Jefferson, Bonneville and Bingham counties were considered. Species with habitat requirements similar to the conditions occurring in and around the test area were included in the table. Sensitive species that were not included in the table were considered no likely to be present because the habitat around the test area is not suitable due to topography, soils, or climate.

Table 2 Sensitive species potentially occurring on or around the test area and appropriate State of Idaho, U.S. Forest Service Region 4, and/or Bureau of Land Management Ranking

Scientific Name	Common Name	Presence Confirmed
Allenrolfea occidentalis	iodinebush	No
Astragalus aquilonius	Lemhi milkvetch	No
Astragalus oniciformis	Picabo milkvetch	No
Catapyrenium congestum	earth lichen	No
Ipomopsis polycladon	spreading gilia	No
Silene scaposa var. *lobata*	Lost River silene	No

None of the species named in Table 2 that are sensitive and could potentially occur on or around the test area were confirmed to be present. However, the surveys were conducted late in the growing season (July 2005) making it difficult to identify some of the species that senesce (grow old and die) by early summer such as spreading gilia and Lost River silene.

4.4.2 Plant Species in the Proposed Location

Two distinct vegetation community types occur around the proposed test area. One plant community type occurs on basalt outcroppings and in the shallow soils on ridges immediately adjacent to those outcroppings. The second plant community type occurs in the deep well-drained sandy soils in the basins and bowls around the basalt outcroppings. The vegetation communities of the proposed test area are characteristic of excellent condition sagebrush steppe subsequent to wildland fire. The communities are dominated by native perennial grasses with abundant native perennial and annual forbs. Some resprouting shrubs are also present within the vegetation communities.

Native perennial grasses that dominate the plant community on the ridges adjacent to basalt outcroppings include needle-and-thread grass and Indian ricegrass. Sandberg bluegrass and bottlebrush squirreltail are also present in shallow soils on the ridges. Common perennial forbs on the basalt outcropping and on the adjacent ridges include: ballhead ipomopsis, turpentine wavewing, and cushion buckwheat. Native annual forbs common in this community type include nodding buckwheat, flatspine stickseed, and Pinyon Desert cryptantha. Broom snakeweed and dwarf goldenbush are abundant shrubs on outcroppings in this vegetation community, and green

rabbitbrush and gray horsebrush are resprouting shrubs that occasionally occur along the ridges. Two species of non-native, weedy species, cheatgrass and musk thistle also occur on the basalt outcroppings. Cheatgrass can become quite abundant on some outcroppings.

The deep, sandy soils of the basins and bowls are dominated by needle-and-thread grass, and thickspike wheatgrass. This plant community has a very high diversity of native perennial forbs. Abundant perennial forb species include; painted Milkvetch, Geyer's Milkvetch, lemon scurfpea, sand dock, fernleaf biscuitroot, thorn skeletonweed, pale evening primrose, and tapertip hawksbeard. However, many additional forb species occur regularly and may be locally abundant. Introduced species are relatively rare in this plant community and occur only occasionally. Introduced species include Russian thistle and desert alyssum.

Shoshone-Bannock tribal members identified Desert-Parsely, Lomatium spp. in the proposed project area during a visit to the site in July 2005. This plant is also present throughout the INL site. The plant, also known as "do tsa" in the Shoshone-Bannock language, is important to the Tribes for medicinal uses and as a food source.

4.4.3 Invasive and Non-Native Species

A total of eleven Idaho Noxious weeds have been identified on the INL. Of those, only musk thistle presently occurs on or near the proposed test site. In a 1999 literature survey, 46 exotic species that are weeds capable of invading sagebrush steppe ecosystems were identified, with as many as 20 of these classified as highly invasive and competitive. Other significant non-native and/or invasive plants found on or near the proposed test site include cheatgrass, Russian thistle, halogeton, tumble mustard and crested wheatgrass.

Within the 450-ft radius zone around the test area there are two areas of concern with regard to invasive and non-native species. There is an area covering approximately 19,000 ft^2 in the northeast quadrant of the 450-ft radius area about 260 ft from the center of the test area. This area is a dune with a high density of Russian thistle and cheatgrass. There are native species present on this dune as well. There is an area covering approximately 35,000 ft^2 in the northern part of the 450-ft radius area about 230 ft from center of the test area. This area has a high density of crested wheatgrass mixed with native species. There are also some large outcrops dominated by cheatgrass about 1000 ft to the southwest of the test area.

4.5 Wildlife, including Threatened and Endangered Species

The Twin Buttes Allotment, which is the general area where the proposed test site it located, is important to a wide range of native wildlife species that seasonally occupy an increasingly important sagebrush habitat. The allotment is breeding habitat for species associated with shrub-steppe such as the pronghorn, ferruginous hawk, burrowing owl, sage sparrow, and sage grouse. The allotment provides a year-round range for antelope, mule deer, and elk. The allotment has been identified as crucial breeding and winter habitat for sage grouse.

4.5.1 Special Status Wildlife Species

Table 3 lists special status wildlife species that have been identified as occurring or potentially occurring within the Twin Buttes Allotment. BLM includes the following as special status species:

(1) Species officially listed or proposed for listing as threatened or endangered under the Endangered Species Act (ESA) or candidates for listing as threatened or endangered under the ESA.
(2) Species listed by a State in a category such as threatened or endangered implying potential endangerment or extinction.
(3) Species designated by the BLM State Director as sensitive.

Table 3 Wildlife Special Status Species and Occurrence within the Twin Buttes Allotment

Species	Status[a]	Occurrence	Remarks
Sage grouse	S	Present	Key habitat and population stronghold
Prairie Falcon	S	Present	Forages throughout allotment. Nesting aeries not identified
Ferruginous Hawk (*Buteo regalis*)	S	Present	Breeding habitat, 1 nesting territory within allotment
Brewer's sparrow	S	Present	Breeding habitat
Pygmy rabbit	S	Present	Active colonies identified on INL

a. **Status Codes: T=Federal Threatened Species; XN=Experimental, Non-essential; S=BLM Sensitive Species**

There are no threatened or endangered species known to be present within the Twin Buttes Allotment, the proposed test location.

4.5.2 Wildlife in the Proposed Project Area

After the fire that occurred during 1999 in the proposed project area, the habitat changed from a dominant sagebrush ecosystem to dominant grassland system, which contained a scattering of sagebrush plants and lava outcroppings. This changed how wildlife utilizes the immediate area. Although species such as the pygmy rabbit, sage sparrow, and Brewer's sparrow, which are basically dependent upon sagebrush exist, species that thrive in grasslands such as elk, cottontail rabbits, horned larks, and vesper sparrows predominate. Sagebrush dependent species, such as the sage grouse, continue to flourish in the surrounding sagebrush areas and may occur in these adjacent grasslands.

Species that permanently reside in the proposed project area include small and medium sized mammals (e.g. bushy-tailed woodrat, Ord's kangaroo rat, black-tail jackrabbit, cottontail rabbit) and reptiles. These species have small home ranges, limited mobility, or a social structure that restricts movement.

During the project's ecological assessment in July 2005, the western rattlesnake, gopher snake, northern sagebrush lizard, and short-horned lizard were observed to use the rocky outcroppings that surround the proposed project area. The presence of rattlesnakes and gopher snakes suggests that a snake hibernacula is present in general area. Two species considered uncommon on the INL, leopard lizards and desert striped whipsnakes, have only been found in the general area of the proposed project on the INL but were not observed during the July 2005 assessment.

Several species of small mammals were observed in the proposed project area. These include, black-tailed jackrabbit, cottontail, Townsend's ground squirrel, Bushy-tailed woodrat, Ord's kangaroo rat, deer mouse, and montane vole. Although these species are not listed on any sensitive list, they do provide a food resource for many that are listed such as prairie falcon, ferruginous hawk, bald eagle and golden eagle. These small mammal species also provide a major prey base for coyotes using the proposed project area.

Many species use the proposed project area in a transitory manner. Species that use the area in this manner are in search of prey or forage, areas to reproduce, or shelter from the elements. All bird and big game species use the area in this manner. Although sage grouse primarily use sagebrush-dominated areas, droppings observed in the surveyed area suggest that they occur the area. Other birds observed using the area for breeding include horned lark, western meadowlark, vesper sparrow, loggerhead shrike, grasshopper sparrow, rock wren, nighthawk, red-tailed hawk, ferruginous hawk, and common raven.

Ferruginous hawk surveys conducted in the Little Lost River Valley in 1976 and again in 1997 indicate static population trends. The Rangeland Health Assessment conducted in 2003 for the allotment shows an upward trend in perennial herbaceous cover within the Twin Buttes Grazing allotment that should benefit the prey base of species such as the Ferruginous hawk. A survey in July of 2005 identified a ferruginous hawk nest within 2 miles of the proposed test location. However, it does not appear to have been used during the recent breeding season. Bald eagles have been observed using the general area during the winter and golden eagles have been observed using the area throughout the year.

Both elk and pronghorn have been observed during annual surveys using the proposed area throughout the year. Elk and pronghorn benefit from fires due to the increased herbaceous vegetation production. A 2000 research study conducted on the INL found that elk used the general area that includes the proposed test area for calving purposes. Also, pronghorn have been observed using the area for fawning. The INL provides critical winter range for both elk and pronghorn with numbers reaching 1,000 and >3,000, respectively. It is estimated that more than 100 elk and approximately 500 pronghorn summer on the INL. Large herds numbering more than 130 individuals have been observed using the proposed project area during different times of the year.

Even though nocturnal species such as bats are difficult to locate during daytime surveys, past studies indicate bats use the INL throughout the year. The western small-footed myotis is considered the most abundant bat on the INL during the spring and summer roosting in sagebrush, junipers, buildings, and rocky outcroppings. Townsend's big eared bat, a BLM sensitive species has been documented roosting in caves and lava tubes throughout the INL as

recently as 2003. However, no lava tubes were found or documented within a two-mile radius of the project area.

5.0 WHAT ARE THE ENVIRONMENTAL CONSEQUENCES OF, AND MITIGATIVE MEASURES FOR, THE PREFERRED ALTERNATIVE?

Consequences or impacts are measured in terms of direct, indirect, long-term, and short-term impacts. Another category of impact, cumulative impacts, is further discussed in Section 7.

Those elements that are present and affected by the preferred alternative are discussed in the following sections and mitigation measures, when applicable, are identified.

The U.S. Bureau of Mines has collected and published data on the effects of an explosion of different magnitudes. The following information is based on an explosion of 15,000 pounds TNT-equivalent ANFO. An explosion of 15,000 lbs TNT-equivalent would produce a fireball approximately 120 feet wide and 480 feet high. Each test would produce a crater up to 60-feet wide and 4-6 feet in depth.

Perceptible Thresholds are those limits when an individual can detect that the test has taken place. For an explosion of 15,000 lbs, the following can be perceived:

- At up to .3 miles away, ground shock is felt.
- At up to 1.5 miles away, an air shockwave exists
- At up to 4.2 miles there is a slight potential for a large pane window to have cracked glass due to the airblast. The probability for this to occur is 1 in 10,000.

The distances from the proposed test site and anticipated sounds pressures from each test at the various locations are indicated in Table 4.

Table 4 Distances to various locations and sound decibels at those locations

Location	Distance in miles	Distance in feet	Sound decibel from each test at each location
Naval Reactors Facility	14.4 miles	76,032 feet	128 dB
Reactor Technologies Complex (formerly the Test Reactor Area)	18.2 miles	96,096 feet	126 dB
Material and Fuels Complex (formerly Argonne National Laboratory – West)	7.8 miles	41,184 feet	134 dB
Test Area North (TAN)	9.9 miles	52,272 feet	132 dB
Nearest INL Boundary	8.4 miles	44,352 feet	133 dB
Closest Public Road	8.6 miles	45,408 feet	133 dB
Closest Inhabited Building	11.1 miles	58,608 feet	131 dB
Sage Brush Step	2.2 miles	11,616 feet	146 dB

The decibel (abbreviated dB) is the unit used to indicate the intensity of a sound. On the decibel scale, the smallest audible sound (near total silence) is 0 dB. A sound 10 times more powerful is 10 dB. A sound 100 times more powerful than near total silence is 20 dB. A sound 1,000 times more powerful than near total silence is 30 dB. Here are some common sounds that have dB ratings similar or higher than that, which would be heard from each of the two proposed tests:

- 120 dB ambulance siren
- 120 dB hammer on nail
- 125 dB chain saw
- 130 dB jackhammer, power drill
- 130 dB percussion section at symphony
- 140 dB airplane taking off
- 143 dB bicycle horn
- 150 dB jet engine taking off
- 150 dB firecracker
- 156 dB capgun
- 157 dB balloon pop

5.1 Cultural Resources

Archaeological surveys of the proposed test area indicate that no sensitive archaeological sites would be impacted within the 450-foot radius project area. Visual inspection of the 60-foot wide crater after each of the tests would help to ensure that impacts to any archaeological resources with no visible surface remains are assessed and sensitive artifacts are salvaged, as necessary.

Impacts to resources of importance to the Shoshone-Bannock Tribes would be unavoidable. Mitigation of these impacts would involve working directly with the Tribes. Plants of interest to the Tribes that are located within the 450-foot project area would be destroyed, animals would have to change their patterns of movement temporarily and may suffer harmful effects, and archaeological sites of ancestral importance may be damaged by road usage. Tribal members have also expressed concern that the blast would impact local lava tube caves of sacred importance and the underlying Snake River Plain aquifer.

All of the explosives would be consumed during each proposed explosive event, thus eliminating any risk to the aquifer. An ecological assessment conducted in July 2005 did not find any lava tubes within a 2 miles radius of the proposed test location. A geological assessment of the potential for lava tube impacts found that lava tubes farther than 1 mile have experienced earthquake or other accelerations greater than what would be produced by this explosion and therefore explosion impacts are likely to be minimal on lava tubes at that or greater distances.

5.2 Air Quality

An Air Permitting Applicability Determination (APAD) INL-05-001 was issued in August 2005 to estimate the potential air pollutant emissions. An APAD is the documentation that demonstrates whether or not a project needs an air permit. This documentation can be requested from the regulator, the State of Idaho.

These calculated releases for the APAD for this project are based on the proposed action activities. The release scenario assumes:

- A single detonation in 2005 and a single detonation in 2006;
- The detonation would use no more than 15,000 lbs. of ANFO and no more than 250 lbs of RDX (booster material);
- The area generating particulate releases would be 120 feet in radius;
- Estimated emissions were based on factors from *AP-42, Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Area Sources*, Fifth Edition, January 1995;
    - Detonation Products – from Table 13.3-1 Emission Factors for Detonation of Explosives;
    - Particulate Matter – from Table 11.9-1 Emission Factor Equations for Uncontrolled Open Dust Sources at Western Surface Coal Mines (Blasting Coal or Overburden);
- All Particulate Emissions were assumed to be PM-10.

As outlined in the APAD, the calculated releases of non-radioactive, criteria pollutants and State of Idaho Toxic Air Pollutants are all below applicable health-based limits for the activities (see Table 5). The modeling of these emissions was completed using T-SCREEN. T-SCREEN models the emissions on an episodic basis (one-time) 15-minute release, which is more consistent with explosive detonation.

Radiological emission calculations are not a concern for this project as there are no radiological materials used or within the blast area.

Table 5 Non-Radioactive Emission Comparison to Regulatory Standards

Contaminant	Emissions (g)/detonation	Averaging Period	Calculated Concentration (ug/m^3)[a]	Regulatory Limit[b] (ug/m^3)
Criteria Pollutants				
SO_2	6804	3 hr	13	1300
CO	239047	8 hr	177	10000
NO_2	57834	Annual	0.005	100
PM_{10}	61236	24 hr	15	150
Toxic Pollutant-NH_3	2722	24 hr	1	900
a. From TSCREEN model. Concentration modeled to nearest ambient receptor, which is INL boundary, 13518 m distant.				
b. Limits are National Ambient Air Quality Limits for criteria pollutants (40 CFR 51), and NH_3 standard is from the State of Idaho Toxics (IDAPA 58.01.01.585).				

All emission values for the pollutants of concern do not exceed a regulatory limit and thus no additional permits are required.

5.3 Soils

Soil disturbance would result in a direct loss of native vegetation and would provide opportunities for invasive and other non-native plants to become established. In the proposed project, soil would be disturbed in an area approximately 60 feet in radius and 4-6 feet deep after each test. The explosion would cause soils to form in a lip around the 60-foot crater. At the conclusion of both tests, proposed project personnel would clean the area of ordnance and debris. After the first test, the lip would be leveled in preparation of the test in 2006. At the conclusion of the second test, the crater would be filled and re-graded to the slope that currently exists. Material from another location may be required.

Soil disturbance should also be anticipated due to vehicle traffic to and on the proposed test site. This is due to the limited trafficability attributed to these particular soil types. These soils, and the potential for impact by vehicles, exist at the proposed test area and along a substantial portion of the route to the proposed site. Project personnel would limit the amount of traffic to the project site and on the project site itself to reduce the size of the area of disturbed soil.

Best management practices would be utilized to minimize soil disturbances to limit the impacts to soil and vegetation, and greatly reduce the efforts required for revegetation and weed management. The practices would include:

- Designation of roadways, parking and laydown areas and restricting traffic to those designated areas.
- Limiting the amount of traffic allowed access to, and on, the project site.
- Limiting re-grading of soil to the crater itself.

5.4 Vegetation

An area of approximately 450 feet in radius from the center of the test location would be mowed to reduce the possibility of starting a wildland fire. Mowing should have little if any direct impact on the native vegetation present at the proposed site. Care would be taken to not disturb soil while mowing the proposed site. Direct loss of native plants is expected in the 60-ft radius area due to soil disturbance associated with the blast. Likewise, direct loss of vegetation would result from soil disturbance associated with traffic on and near the test site and on the road leading to the test area. This loss might be mitigated through revegetation of the disturbed areas.

5.4.1 Invasive and Non-Native Species

Soil disturbance is a primary contributor to the spread of invasive plants. Invasive and non-native plants are present on the 450-ft radius area and could be spread by mowing. Because it is necessary to mow the area in order to reduce the likelihood of a potential wildfire, the two areas of invasive and non-native plants described in the Affected Environment section would be mowed after the rest of the area has been mowed. This would limit spreading their seeds into areas presently not infested. Failure to limit seed dispersal from these areas would likely increase the level of effort necessary for revegetation and weed management.

5.4.2 Revegetation Plan

Revegetation of all areas with soil disturbance and loss of native vegetation would be accomplished based on the guidelines of Anderson and Shumar (1989) and Twitchell (2001). The revegetation target for this project should be to achieve 70 % of the cover and of the species present in the surrounding undisturbed native plant community.

Because of the soil properties at the test area, the range of possible methods for revegetation is severely limited. The primary concerns are the very high risk for wind erosion and the low water holding capacity. These factors make revegetation on the proposed test area extremely difficult and the potential for success is unknown.

Transplanting of container-grown stock, bare-root stock, or wildings would be utilized as mature plants are hardier and may produce seed in the first growing season if they receive enough water and are not heavily grazed. Transplanted wildlings could include bunch grasses, forbs, and shrubs. Transplanting wildlings that are already established and mature may yield a better chance of restoration for the test area. Another advantage of planting wildlings is that the vertical structure of the mature plant acts as a wind break reducing the risk of wind erosion and increasing the soil stability of the site. The best source for wildings would be the surrounding undisturbed native plant community.

An experience revegetation contractor would be utilized for this work. As part of this revegetation effort, the contractor would perform monitoring for any noxious weeds. The test area would be visited at least annually, early in the spring, in order to do maintenance as necessary. Monitoring would continue until the 70% revegetation goal is met.

5.5 Wildlife, including Threatened and Endangered Species

The impact of the proposed action would result in 1) unavoidable loss of ground-dwelling wildlife species and associated habitat at the test location, 2) displacement of certain wildlife species from the cleared area, and 3) an increase in the potential for collisions between wildlife and motor vehicles, although this impact is expected to be minimal due to the slow travel speeds required on the roads to proposed test area.

As indicated in Section 3.13, animals that are within 144 feet of the explosion would most likely suffer death and those within 503 feet of the test may suffer some type of injury such as hearing damage or blunt trauma. Also, any animals' dens that are within 144 feet of the explosion may collapse. Those potential deaths would be to individuals, but would not be expected to impact the populations of those species. DOE would begin work at the proposed test location approximately four weeks prior to each test. Activities at the proposed location would serve to keep much of the wildlife in the vicinity out of the affected area.

Noise affects wildlife differently from humans and the effects of noise on wildlife vary from serious to nonexistent in different species and situations. The potential exists for the initial blast to temporarily displace wildlife from the area. However, these impacts should be minimal and would not harm local wildlife populations.

5.5.1 Greater sage grouse

Although the 1999 burn resulted in a significant long-term impact on nesting habitat, sage grouse still occupy areas of dominant sagebrush adjacent to the proposed test site during winter and spring. It is likely they use the proposed test site in a transitory manner year round. Maintaining vehicular speeds of less than 15 mph on all access roads to the test area would minimize potential impacts of the proposed action on sage grouse that use the area.

5.5.2 Migratory Birds

There is a potential for migratory birds to occupy the habitat of the proposed test site during the time period of April 15 and September 1. If mowing, removal of vegetation, or the tests occur during this time, a breeding bird survey would be conducted to determine any impacts to breeding birds at the proposed test site and extending out 500 feet in radius. In the unlikely event that nests with eggs or young are found in the area, DOE would work with the U.S. Fish and Wildlife Service Migratory Bird Program Office to ensure the Department remains in compliance with the requirements of the Migratory Bird Treaty Act. Since activities related to the first test are not planned to occur prior to September 1st, a breeding bird survey would not be required, but may be required prior to the second test.

Ferruginous hawk nestlings fledge generally during the last week of June or the first week of July. After fledging, the young hawks continue to center their activity around the nest and develop their aerial skills to the point that they can successfully reach their wintering grounds. Based on habitat requirements for this species and the presence of an inactive nest, the potential exists for them to occur in the project area. If the nest were active in 2006, DOE would work with the U.S. Fish and Wildlife Service to minimize or eliminate any potential disturbance to the hawks.

5.5.3 Breeding Seasons

The proposed project area provides important breeding habitat to many species during the spring, thus seasonal restrictions should be imposed in order to prevent any detrimental effects to breeding populations. The following are times when specific animals are breeding, nesting, or birthing.

- Sage Grouse - February 15 - June 30
- Passerines - April 15 - June 30 (a few nest until Sept 1)
- Raptors - January 1 - July 1
- Snakes - August - September
- Pygmy rabbits - February – July

Every effort would be made to avoid these times. Nevertheless, if the second test is conducted during these timeframes, an additional wildlife assessment would be conducted in order to minimize or mitigate impacts to these species.

5.6 Safety and Health

Because each test involves the use of up to 15,000 lbs TNT-equivalent of explosives, there is the possibility of damage resulting from the blasts. Injury Thresholds are those limits when damage and injury to individuals and animals may occur.

For an explosion of 15,000 lbs TNT-equivalent of explosives, the following injuries are possible:

1. At up to 503 feet, hearing loss may occur.
2. At up to 275 feet, there is a 50% chance of a minor eardrum rupture.
3. At up to 231 feet, the airblast may result in a primary blast injury.
4. At up to 152 feet, blunt trauma injury may occur.
5. At up to144 feet, death could occur due to the airblast.
6. At up to 225 feet, the secondary debris (portions of the protective elements being tested) could land.

The technical data relating to movement and sound for various locations at the INL site, to the nearest inhabited building, and the closest public road are indicated in Table 6. These calculations were based on formulae from Dowding.

Table 6 Motion and Sound at Various Locations for an Explosive Event of 15,000 lbs TNT-Equivalent of Explosives

Site Location	Ground Displacement (inches)	Peak Partial Velocity (in/sec)	Acceleration (g)	Sound Level (dB)
NRF	0.000421	0.001821	0.000035	128
RTC	0.000326	0.001293	0.000023	126
Nearest INL Boundary	0.000763	0.003999	0.000095	133
Closest Public Road	0.000743	0.003864	0.000091	133
Closest Inhabited Building	0.000561	0.002662	0.000057	131
Sagebrush Steppe	0.003328	0.028	0.001119	146

The Occupational Safety and Health Administration (OSHA) limit for worker exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level (29 CFR Part 1926.529(e)). The sound from the explosion is below this OSHA limit. To ensure that the test is below the 140 dB threshold, the event would not occur during unsuitable environmental conditions, when high wind and temperature inversions are present. Also, all efforts would be made to conduct the test on a day, like the common Friday off, when many INL site workers are not present.

The anticipated ground displacement data at a various locations are given in Table 6. Blasting safety literature generally cites an explosion induced peak ground velocity "safe limit" of two inches per second. The anticipated ground displacement for the nearest inhabited structured is expected to be 0.003 inches per second.

Ground motion and air blast data would be rigorously recorded at various locations. Although all of the empirical data indicates that the ground movement would be minimal at the above-listed locations, the recording devices would record any site-specific effects

5.7 Environmental Justice

Executive Order 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs Federal agencies to address disproportionately high and adverse human health or environmental effects of proposed projects on minority populations and low-income populations. Because this proposed project would be located in a remote portion of the INL with localized impacts, DOE anticipates there would be no long-term or disproportionately and adverse impacts to human health or the environment. Therefore, there would not be long-term or disproportionately adverse impacts to minority populations.

6.0 WHAT ARE THE ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE?

If DOE selected the No Action Alternative, the proposed project would not be conducted and the associated impacts from the proposed project to INL resources would not occur.

7.0 WHAT ARE THE CUMULATIVE IMPACTS OF THE PREFERRED ALTERNATIVE?

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

7.1 Cultural Resources

No known sensitive archeological sites would be impacted within the 450-foot project area. Therefore, DOE does not expect any cumulative impacts to archeological resources. In addition, DOE would work with the Shoshone-Bannock Tribes to mitigate potential impacts to other resources important to them.

7.2 Air Quality

Table 2 shows the cumulative impacts for air emissions from past, present, and reasonably foreseeable actions at the INL.

Table 7 Cumulative Non-Radioactive Emission with Comparison to Regulatory Standards

Contaminant	Emissions: (g)/detonation	Averaging Period	Calculated Concentration (ug/m^3)[a]	INL Site Site Sources Concentration (ug/m^3)[b]	Calculated Concentration Plus Other Sources (ug/m^3)	Regulatory Limitc (ug/m^3)
Criteria Pollutants						
SO_2	6804	3 hr	13	151	164	1300
CO	239047	8 hr	177	75	252	10000
NO_2	57834	Annual	0.005	2.4	2.4	100
PM_{10}	61236	24 hr	15	38	53	150
Toxic Pollutant - NH_3	2722	24 hr	1	NA	1	900

a. From TSCREEN model. Concentration modeled to nearest ambient receptor, which is INL boundary, 13518 m distant.

b. Source: Draft Environmental Impact Statement for the Proposed Consolidation of Nuclear Operations Related to Production of Radioisotope Power Systems, June 2005.

c. Limits are National Ambient Air Quality Limits for criteria pollutants (40 CFR 51), and NH_3 standard is from the State of Idaho Toxics (IDAPA 58.01.01.585).

The analysis shows a negligible cumulative impact to overall air quality at the INL site if the proposed action were implemented.

7.3 Ecology

Impacts to vegetation and wildlife from existing operations occur mainly from operations that affect undisturbed native vegetation. Those activities include the use of borrow source materials such as gravel, silt, and clay and operations associated with industrial landfills on the INL Site. Those impacts have localized impacts to individual plants and animals in those areas, but have limited effects on the populations of those species.

Other associated impacts from a reasonably foreseeable project could be from the construction of a road between the Materials and Fuels Complex and other facilities on the INL Site and the construction of additional operational facilities. If implemented, those activities may have impacts to vegetation and wildlife caused by the removal of vegetation and the associated displacement and potential mortality of wildlife. As with existing activities those impacts would be localized and affect individuals of various species but are not expected to affect populations of those species. The additional cumulative impacts to vegetation and wildlife from the proposed

tests are not expected to cause any noticeable change to any populations of species affected by the action.

8.0 COORDINATION AND CONSULTATION

DOE has coordinated with the Shoshone-Bannock Tribes and the Bureau of Land Management in the development of the draft Environmental Assessment. In a letter dated July 26, 2005, the Department of Energy notified the U.S. Fish and Wildlife Service of it's initial determination that implementing the proposed action would not have a potential to impact threatened or endangered species and that formal consultation is not warranted. The Department is presently awaiting the response.

9.0 REFERENCES

AP-42, Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Area Sources, Fifth Edition, January 1995.

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Air Permitting Applicability Determination (APAD), INL-05-001, for the "Two Dynamic Tests for Protective Elements and Vehicles Project", August 2005.

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Bureau of Land Managements Environmental Assessment titled, "Grazing Permit Renewal for Twin Buttes Allotment" (EA ID-074-2004-026), dated May 2004.

Department of the Army Field Manual 5-250, "Explosives and Demolitions", June 15, 1992.

Department of Defense Standard 6055.9, "DOD Ammunition and Explosives Safety Standards", December 13, 2002.

Department of Energy – Idaho Operations Office, 2004, *Idaho National Engineering and Environmental Laboratory Cultural Resource Management Plan*, DOE/ID-10997, Rev. 0, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho, August 2004.

Department of Energy *Agreement-in-Principle* (between the Shoshone-Bannock Tribes and the U.S. Department of Energy), December 10, 2002.

Dowding, Charles, "Blast Vibration Monitoring and Control", 1985.

Stoller Corporation, "Ecological Review for an Environmental Assessment for the Two Dynamic Tests for Protective Elements and Vehicles Project DOE/EA-1537", STOLLER-ESER-85, August 2005.

APPENDIX A. GLOSSARY

Affected Environment. The physical features, land, area, or areas to be influenced, or impacted, by an alternative under consideration

APAD. Air Permitting Applicability Determination. The documentation that is prepared for a project to determine whether an air permit is needed.

Basalt. A hard, dense, dark volcanic rock composed chiefly of plagioclase, pyroxene, and olivine, and often having a glassy appearance.

Bedrock. The solid rock that underlies loose material, such as soil, sand, clay, or gravel.

Best Management Practices. Practices designed, implemented, and maintained to give full protection to the environment.

Booster Material. A chemical that is used to ensure that an explosion properly detonates.

Calcareous Soils. Soils that contain calcium carbonate.

Council on Environmental Quality (CEQ). A council established by the National Environmental Policy Act of 1969, as amended (Public Law 91-90, 42 U.S.C. 4321-4347, January 1970, as amended by Public Law 94-52, July 3, 1975, and Public Law 94-83, August 9, 1975). The Council's duties are described in Title II of the National Environmental Policy Act.

Cultural resource. Prehistoric or historic sites, structures, districts, landscapes or objects of some importance to a culture or community for scientific, traditional, religious, or other reasons. A broad general term meaning any cultural property or traditional lifeway value.

Cumulative impacts. Impacts that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

Decibel. The decibel (abbreviated dB) is the unit used to indicate the intensity of a sound. It is equal to 20 times the common logarithm of the ratio of the pressure produced by the sound wave to a reference pressure (typically 1 micropascal at 1 meter).

Environmental Assessment (EA). A concise public document for which a Federal agency is responsible that serves to: (1) Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

Environmental Impact Statement (EIS). A document that serves to ensure that the policies and goals defined in NEPA are incorporated into the programs and actions of the Federal government. An EIS gives a full and fair discussion of significant environmental impacts. The

EIS informs decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.

Finding of No Significant Impact (FONSI). A document, based on an environmental assessment by a Federal agency briefly presenting the reasons why an action would not have a significant effect on the human environment and for which an environmental impact statement would therefore not be prepared.

Fledgling. A young bird that has recently acquired its flight feathers.

Herbaceous Vegetation. Relating to or characteristic of an herb as distinguished from a woody plant.

Hibernacula. A protective structure in which an organism remains dormant for the winter.

Historic. Historic represents about 150 to 50 years before present.

Home Range. The geographic area to which an organism normally confines its activity.

Infrastructure. The basic facilities, services, and installations needed for the functioning of the INL, such as transportation and communications systems and water and power lines.

National Ambient Air Quality Standard (NAAQS). Those standards set forth by federal law establishing maximum levels of air pollutants that can exist in the ambient air without producing an adverse effect to humans (primary standard) or the public welfare (secondary standard).

National Environmental Policy Act (NEPA). A Federal law, enacted in 1970, that requires the Federal government to consider the environmental impacts of, and alternatives to, major proposed actions in its decision-making processes. Commonly referred to by its acronym, NEPA.

Nocturnal. Most active at night.

Off-site. An area outside the INL site boundaries.

On-site. The area within the INL boundaries. This does not include in-town facilities.

Prehistoric. Prehistoric represents about 12,000 to 150 years before present.

Prevention of Significant Deterioration (PSD). Clean Air Act standard designed to "protect public health and welfare from any actual or potential adverse effect . . ." (42 U.S.C. Title 42). The Public Health and Welfare, Chapter 85--Air Pollution Prevention and Control, Subchapter I--Programs and Activities, Part C--Prevention of Significant Deterioration of Air Quality.

Senescence. The process of growing old and dying. Gradual deterioration of function in an organism leading to an increased probability of death; aging.

Transitory. Existing or lasting only a short time; short-lived or temporary.